

Do all work on a separate piece of paper.

1-9 Sketch each angle in standard position and give the reference angle.

1. 60° 2. 135° 3. -120° 4. 540° 5. $\frac{3\pi}{4}$ 6. $\frac{4\pi}{3}$ 7. $\frac{-2\pi}{3}$ 8. $\frac{19\pi}{4}$ 9. 5.2

10-15 Determine two coterminal angles(one positive and one negative) for each angle. Give answers in the same form as the question.

10. 78° 11. -850° 12. $\frac{5\pi}{4}$ 13. $\frac{16\pi}{3}$ 14. 7π 15. 2.4

16-20 Find (if possible) the complement and supplement of each angle.

16. 280° 17. 57° 18. $\frac{3\pi}{5}$ 19. $\frac{\pi}{7}$ 20. 0.6

21-26 Convert from degrees to radians or radians to degrees without using a calculator.

21. 330° 22. $\frac{5\pi}{12}$ 23. -225° 24. 4π 25. $\frac{-\pi}{6}$ 26. 270°

27-30 Convert from degrees to radians or radians to degrees. Round answers 3 decimal places.

27. 3.14 28. 17° 29. -51° 30. $\frac{\pi}{13}$

31-33 Find the exact value of the function using the given information. Assume all angles are in the first quadrant.(hint: draw a picture)

31. $\sin\theta = \frac{\sqrt{3}}{4}$; $\sec = ?$ 32. $\cot\beta = 4$; $\cos\beta = ?$ 33. $\csc\alpha = \frac{\sqrt{5}}{2}$; $\tan\alpha = ?$

34-37 Use $\sec\theta = \sqrt{5}$, and identities to find the value of the function.

34. $\cos\theta$ 35. $\sin\theta$ 36. $\tan\theta$ 37. $\csc(\frac{\pi}{2} - \theta)$

38-43 Evaluate the trigonometric function without using a calculator.

38. $\sin 60^\circ$ 39. $\tan \frac{\pi}{6}$ 40. $\cos \frac{\pi}{4}$ 41. $\sec \frac{\pi}{3}$ 42. $\cot 45^\circ$ 43. $\csc 30^\circ$

44-51 Use a calculator to evaluate each function. Round answers to 3 decimal places.

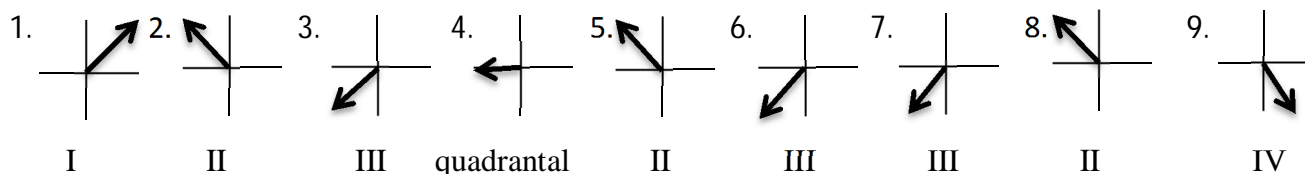
44. $\sin 37.2^\circ$ 45. $\sec 1.3$ 46. $\tan 72^\circ$ 47. $\csc \frac{\pi}{7}$ 48. $\cos \frac{1}{2}$

49. A right triangle has a hypotenuse of length 8 inches. If one angle is 35° , find the length of each leg.

50. A ship is just offshore of New York City. A sighting is taken of the Statue of Liberty, which is about 305 feet tall. If the angle of elevation to the top of the statue is 20° , how far is the ship from the base of the statue?

51. To measure the height of Lincoln's caricature on Mt. Rushmore, two sightings 800 feet from the base of the mountain are taken. If the angle of elevation to the bottom of Lincoln's face is 32° and the angle of elevation to the top is 35° , what is the height of Lincoln's face?

Answers:



10. $438^\circ, -282^\circ$ 11. $-490^\circ, 230^\circ$ 12. $\frac{13\pi}{4}, \frac{-3\pi}{4}$ 13. $\frac{10\pi}{3}, \frac{-2\pi}{3}$ 14. $5\pi, -\pi$ 15. 8.68, -3.88 16. None 17. $33^\circ, 123^\circ$
 18. no complement, $\frac{2\pi}{5}$ 19. $\frac{5\pi}{14}, \frac{6\pi}{7}$ 20. 0.97, 2.54 21. $\frac{11\pi}{6}$ 22. 75° 23. $\frac{-5\pi}{4}$ 24. 720° 25. -30° 26. $\frac{3\pi}{2}$
 27. 179.9° 28. 0.297 29. -0.89 30. 13.85° 31. $\frac{4\sqrt{13}}{13}$ 32. $\frac{4\sqrt{17}}{17}$ 33. 2 34. $\frac{\sqrt{5}}{5}$ 35. $\frac{2\sqrt{5}}{5}$ 36. 2 37. $\sqrt{5}$ 38. $\frac{\sqrt{3}}{2}$
 39. $\frac{\sqrt{3}}{3}$ 40. $\frac{\sqrt{2}}{2}$ 41. 2 42. 1 43. 2 44. 0.605 45. 3.7383 46. 3.078 47. 2.305 48. 0.8776
 49. $a \approx 6.55 \text{ in.}, b \approx 4.59 \text{ in.}$ 50. 837.98 ft 51. 60.27 ft